

Taxonomic notes on *Euphorbia himalayensis* (Klotzsch) Boiss. and allied species (Euphorbiaceae)

M. S. Binojkumar and N. P. Balakrishnan

Botanical Survey of India, Southern Circle, TNAU Campus
Coimbatore-641 003, India.

Abstract

E. himalayensis (Klotzsch) Boiss. *E. luteo-viridis* Long and *E. Wallichii* Hook. f. are closely related species and are often confused. Critical studies of the collections in the various herbaria of the Botanical Survey of India reveal that the identifications are muddled and that Indian specimens labelled as *E. himalayensis* are either *E. luteo-viridis* or *E. wallichii*. Our studies reveal that *E. himalayensis* does not occur within the present political boundaries of India. In an effort to clear the confusion, a key to the species involved, their detailed descriptions and illustrations are provided here.

Euphorbia himalayensis (Klotzsch) Boiss., *E. luteo-viridis* Long and *E. Wallichii* Hook. f. are very closely related Himalayan taxa, often confused and misidentified in the herbaria. During our revisionary work on *Euphorbia* in India and adjoining areas, we had the opportunity to examine the specimens of these species in the various herbaria. (BM, CAL, DD, BSD, KUH, SHC) along with the type specimens or their photographs and have found that the Indian material identified as *E. himalayensis* are either *E. luteo-viridis* or *E. wallichii*.

E. himalayensis (Boissier 1862) is based on *Tithymalus himalayensis* Klotzsch (in Klotzsch & Garcke 1862) described on the basis of a specimen (*Hoffmeister* s. n., B) from the Himalayas, with no precise locality. This specimen was destroyed in

a fire during the Second World War (pers. comm. from Berlin). So, Klotzsch's description of this species now entirely rests upon his illustration (t. 20, see Fig. 1). In spite of J. D. Hooker's comment that the illustration is based on a miserable specimen without fruit, we have found that the illustration shows considerable details of diagnostic value and hence have accepted it as the iconotype of *E. himalayensis* here.

The present study also reveals that among the three species, *E. wallichii* has the widest distribution, extending from Afghanistan in the west to Nepal and Tibet in the east. *E. luteo-viridis* is confined to Central and Eastern Himalayas, while *E. himalayensis* is the most restricted in distribution, occurring only in Nepal, Bhutan and Tibet.

Key to the species

- 1a. Stem leaves narrowly oblong to oblong-lanceolate; pseudo-umbels 6-10-rayed; rays 4-6 cm long; style up to 2 mm long.....*E. himalayensis*
- b. Stem leaves ovate to broadly ovate-lanceolate, elliptic to ovate-elliptic or elliptic-oblong; pseudo-umbels 3-6-rayed; rays 1-3 cm long; style more than 2 mm long.....2
- 2a. Plants 10-40 cm high; stem leaves 1-3 by 1-2 cm; cyathia 2.5-3.5 by 2.5-3.5 mm; glands 5; style 2-3 mm long; capsules 4-5 by 4-6 mm.....*E. luteo-viridis*
- b. Plants 40-70 cm high; stem leaves 5-8 by 1.5-3 cm; cyathia 5-6 by 8-10 mm; glands 4; style 3-4 mm long; capsules 5-7 by 7-8 mm.....*E. wallichii*

Euphorbia himalayensis (Klotzsch)
Boiss. in DC., Prodr. 15(2): 113.
1862, p. p.; Hook. f., Fl. Brit. India 5:
258. 1887, p. p.; Long, Notes Roy.
Bot. Gard. Edinb. 44: 167. 1986.

Tithymalus himalayensis Klotzsch in Klotzsch & Garcke, Bot. Reise Pr. Waldem. 115. 1862; Hurusawa & Tanaka in Hara, Fl. E. Himalaya 182. 1967.

Type: Klotzsch in Klotzsch & Garcke, Bot. Reise Pr. Waldem: t. 20. 1862 [Iconotype]. **Fig. 2A**

Herbs up to 50 cm. Stems many from a thick rootstock; branches many, hirsute or puberulous. Leaves sessile or shortly petiolate, oblong or oblong-lanceolate, rounded at base, entire, subacute or obtuse at apex, 2-3 by 0.7-1.2 cm, glabrous, pale green; nerves not distinct; petioles ca 1 mm long. Pseudumbels 6-10-rayed; rays 4-6 cm long, 3-4-branched; pseudumbel leaves 6-10, subdeltoid, broadly ovate, attenuate at base, entire, acute at apex, 5-7 by 4-6 mm, glabrous, pale yellow; ray leaves 3-4, broadly ovate to orbicular, 0.7-1 by 0.5-0.8 cm. Cyathia solitary, terminal, turbi-

nate, ca 2.5-3 by 2.5-3.5 mm, hirsute; lobes 5, ca 1 by 2 mm, ciliate at apical margin, hairy; glands 4-5, transversely oblong, ca 2 by 1 mm, blackish brown. **Male florets:** pedicels ca 3 mm long; bracteoles filiform, ca 2 by 1.5 mm, glabrous, blackish brown. **Female florets:**

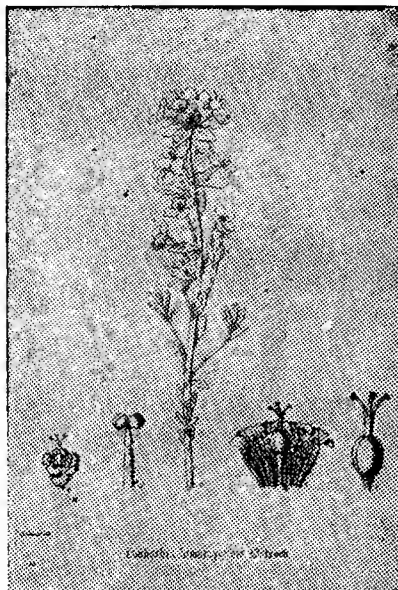


Fig. 1. **Iconotype:** *Euphorbia himalayensis* Klotzsch in Klotzsch & Garcke, Bot. Reise Pr. Waldem t. 20-1862.

Euphorbia himalayensis and allied species

styles 3, connate up to middle, ca 2 mm long; stigma recurved, papillose. Capsules subglobose, ca 5 by 6 mm, smooth.

Flowers & Fruits: April-July.

Habitat: In rocky areas, cliffs, mainly on exposed slopes, 2700 - 4000 m. Not common.

Distrib.: BHUTAN, W. NEPAL and TIBET.

Specimens examined: NEPAL, Tarakot, Bheri River, 3380 m, *O. Polunin, W. R. Sykes & H. J. Williams* 2396 (BM).

Euphorbia luteo-viridis Long, Notes Roy. Bot. Gard. Edinb. 44: 163. 1986.

Type: Sikkim, Kapup, 3960 m, 5. 7. 1913, *Cooper* 160 (Holotype in E, photo!).

E. himalayensis sensu Boiss. in DC., Prodr. 15(2): 113. 1862, p. p.; Hook. f., Fl. Brit. India 5: 258. 1887, p. p., non (Klotzsch) Boiss. **Fig. 2B**

Erect, herbs, 10-40 cm high. Stems many from permanent rootstock, branched towards the apex; young branches crispate pubescent. Leaves sessile or shortly petiolate, elliptic or ovate-elliptic, oblique or subcordate at base, entire, acute at apex, 1-3 by 1-2 cm, glabrous, greenish yellow. Pseudoumbels 3-5-rayed; rays 1-3 cm long; pseudoumbel leaves as many as pseudoumbels, ovate or subovate, 1-2 by 0.5-1 cm; ray leaves 3, broadly ovate, 1-1.5 by 0.8-1.5 cm, yellow or pale yellow. Cyathia terminal, solitary; involucre campanulate, ca 3 by 3 mm, hirsute outside; lobes 5, ca 1 by 1 mm, wavy, hairy at margin; glands 5, transversely oblong, ca 1.5 by 1 mm, blackish brown. **Male florets:** pedicel ca 1 mm; anthers subglobose, transversely dehiscent; bracteoles filiform, ca 2 mm long. **Female florets:** gynophore ca 2.5 mm long; ovary subglobose, ca 2.5 by 2.5 mm,

glabrous, dark green; styles 3, connate up to middle, 2-3 mm long; stigma recurved, minute, bilobed. Capsules ca 4-5 by 4-6 mm, smooth. Seeds ovoid, ca 3 by 2 mm, smooth; caruncle minute.

Flowers & Fruits: May-Aug.

Habitat: Common in rocky forests above 2000 up to 4000 m.

Distrib.: INDIA (Himachal Pradesh: Sikkim and West Bengal), NEPAL and TIBET.

Specimens examined: INDIA: *Himachal Pradesh:* Chumbi, Kalkla, *King's collector* 428 (CAL). *Sikkim:* Thangu, *K. Biswas* 6615; Yenthang, *J. E. Duthie* 159; Above Lachen, *King's collector* s. n. (CAL); Lachen, 400 m, *J. D. Hooker* s. n.; Lachen, 3000-3500 m, *J. D. Hooker* s. n. (K). *West Bengal:* Darjeeling Dt. Phallut, 3750 m, *I. H. Burkil* s. n. (CAL); Darjeeling Phallut, *W. Smith* 7 (BSIM).

NEPAL: Lamache, Danda, 3100 m, *J. P. Dobremz* 252; Arun Vally, Kasola 4200 m, *J. D. A. Stainton* 530 (BM).

Euphorbia wallichii Hook. f., Fl. Brit. India 5: 258. 1887; Bamber, Pl. Punjab 317. 1916; Blatter, Beautif. Fl. Kashmir 2: 107. 1928; R. Smith, Curtis, Bot. Mag. 175: t. 442. 1964; Short & Vickery in Hara et al., Enum. Fl. Pl. Nepal 3: 196. 1982; Dhar & Kachroo, Alpine Fl. Kashmir 250. 1983; Polunin & Stainton, Fl. Himalaya 361. 1984; R. Smith in Nasir & Ali, Fl. Pakistan 172: 140. 1986.

Type: Tibet, Gossain Than, August 1821, *Wallich* 7696 A (Holotype in K-WALL, Photo!). **Fig. 2C**

Erect, herbs, 40-70 cm high. Stems 6-10 from a stout woody rootstock;

branches puberulous. Leaves sessile or subsessile, elliptic-lanceolate, ovate-lanceolate or elliptic-oblong, attenuate at base, entire, acute, subacute or obtuse at apex, 5-8 by 1.5-3 cm, white puberulous on the midrib; scale leaves present towards the base of the stem. Pseudoumbels 4-6-rayed; rays 1-3 cm long, once or twice trichotomous or dichotomous, pubescent; pseudumbel leaves 4-6,

lous on the midrib; scale leaves present towards the base of the stem. Pseudoumbels 4-6-rayed; rays 1-3 cm long, once or twice trichotomous or dichotomous, pubescent; pseudumbel leaves 4-6,

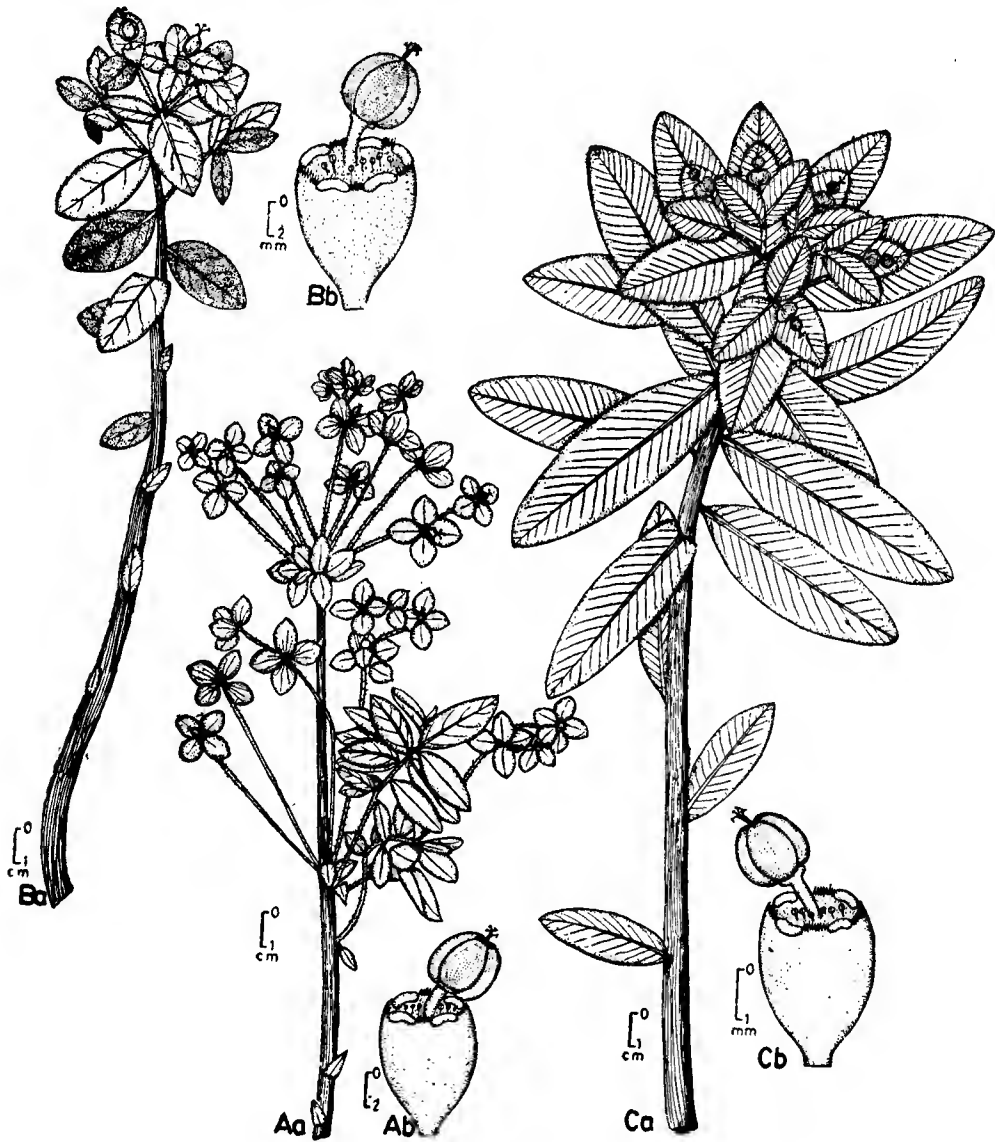


Fig. 2. A. *Euphorbia himalayensis* (Klotzsch) Boiss. Aa. Habit, Ab. cyathium B. *Euphorbia luteo-viridis* Long. Ba. Habit, Bb. Cyathium C. *Euphorbia wallichii* Hook. f. Ca. Habit, Cb. Cyathium.

elliptic, or ovate elliptic, cuneate at base, entire, acute to subacute at apex, 4-7 by 2-2.5 cm, yellow; ray leaves 2-3, ovate or ovate-lanceolate, rounded at base, entire, acute, subacute or obtuse at apex, 1-3.5 by 1-2 cm, glabrous above, white hirsute below, yellow or greenish yellow. Cyathia terminal, solitary, sessile in axillary rays, pedunculate on main stem; involucre cupular, ca 0.6 by 1 cm, glabrous outside, hairy inside; involucre lobes 5, rounded, obtuse, ca 2.5 by 2 mm; glands 4, transversely ovate, ca 4 by 2 mm, slightly undulate at outer edge, pale grey. *Male florets*: pedicels 4-6 mm long; anthers subglobose, transversely dehiscent; bracteoles filiform, lacinate, ca 4 mm long. *Female florets*: gynophore ca 8 mm long; ovary ca 4 by 4 mm, smooth, hirsute; styles 3, connate up to middle, 3-4 mm long; stigma bifid. Capsules subspherical, trigonous, 5-7 by 7-8 mm, smooth, glabrescent. Seeds ovoid, 4-5 by 3-4 mm, smooth, pale grey; caruncle hemispherical, disc-like, closely adpressed to the seeds.

Flowers & Fruits: May-Sept.

Habitat: Dry rocky slopes, open areas or among sparse scrubs and also in

open forest, between the altitudes 2200 to 4100 m.

Distrib.: INDIA (Himachal Pradesh; Jammu & Kashmir and Punjab.), AFGHANISTHAN, NEPAL, PAKISTAN and TIBET.

Note: Though Kanjilal et al. (1940) reported its occurrence in Assam. We could not locate this taxon anywhere in N. E. India. Nor any specimen from this part is available in any of the herbaria.

Specimens examined: INDIA: *Himachal Pradesh*: Hazara Dt. Derahal Khan, Inayat 20143; Chamba, Khajiar to Chamba, 1800 m, L. H. Lace 1604 (DD); Margenla, A. Meebold 2385 (CAL). *Punjab*: Jachola, Shinkari, Hozava, Inayat 20143 (DD). *Kashmir*: Poorna, 3000 m, C. B. Clarke 28795; Kajnagrange, 3000 m, J. E. Duthie 11076 (DD); Kashmir, I. A. Rao 264 (CAL); Kungwatan or Kauns-arang, I. A. Rao 9350 (BSA). NEPAL: Between Judam and Arunkhola, 4000m, L. W. Beer 9460; Pedamara, North East of Jumla, 3150 m, O. Polunin, W. R. Sykes & L. H. J. Williams 4336 (BM).

Acknowledgements

Our thanks are due to the authorities of British Museum (Natural History), London, for loan of specimens and to Berlin Herbarium for literature. Thanks are also due to Mr. R. Suresh, Senior Artist, Botanical Survey of India, Coimbatore for the illustrations.

Literature Cited

Boissier, F. 1862. *Euphorbia*. In: A. P. De Candolle, *Prodromus systematis naturalis regni vegetabilis*, Paris, 15(2): 1-118.

Kanjilal, U. N., Kanjilal, P. C. De, R. N. & Das, A. 1940. *Flora of Assam*, Shillong. Vol. 4.

Klotzsch, F. & Garcke, A. 1862. *Die botanischen Ergebnisse der Reise Prinzen Waldemar von Preussen*. Berlin.